भारतीय मानक
Indian Standard

IS 2753 (Part 2) : 2014
(Reaffirmed 2019)

उपचारित लकड़ी और उपचार करने वाले घोल में परिरक्षकों के आकलन की पद्धतियाँ

भाग 2 ताँबा (ताँबे के कार्बनिक पिररक्षक लवणों में)
ज्ञात करना

(दूसरा पुनरीक्षण)

Methods for Estimation of Preservatives in Treated Timber and in Treating Solutions

Part 2 Determination of Copper
(In Copper Organic Preservative Salt)

(Second Revision)

ICS 71.100.50;79.040

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भारतीय मानक ब्यूरो
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March 2014 **Price Group 3**

Timber and Timber Stores Sectional Committee, CED 9

FOREWORD

This Indian Standard (Part 2) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Timber and Timber Stores Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in 1968. It then provided method for determination of copper in copper naphthenate only and method for determination of pentachlorophenol in treating solution and treated timber. The standard was first revised in 1991 and in the first revision of the standard, the procedure for determination of copper was extended to other copper organic preservative salts. Further, the formulae for calculation of percentage of pentachlorophenol in treating solution and treated timber were modified.

The other Part of the standard is Part 1 Determination of copper, arsenic, chromium, zinc, boron, creosote and fuel oil.

IS 401 : 2001 'Preservation of timber — Code of practice (*fourth revision*)' covers details of preservatives, methods of preservative treatment of timber, etc. These standards IS 2753 (Parts 1 and 2) details the methods of detection and estimation of the preservatives in such treated timber and treating solutions.

In this revision, the provisions with respect to procedure for estimation of pentachlorophenol have been deleted as the use pentachlorophenol has been banned by the Government of India.

The composition of the Committee responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

METHODS FOR ESTIMATION OF PRESERVATIVES IN TREATED TIMBER AND IN TREATING SOLUTIONS

PART 2 DETERMINATION OF COPPER

(IN COPPER ORGANIC PRESERVATIVE SALT)

(Second Revision)

1 SCOPE

1.1 This standard (Part 2) lays down method for the quantitative estimation of copper in copper organic preservative salt solution and in timber treated with copper organic salt.

1.2 This method is intended for the chemical analysis of oils containing the required preservative and wood treated with the same preservative.

2 REFERENCE

The standard listed below contains provision, which through reference in this text constitutes provision of this standard. At the time of publication, the edition indicated was valid. The standard is subject to revision, and parties to agreements based on this standard is encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

IS No.	*Title*
1070 : 1992	Reagent grade water (*third revision*)

3 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in the tests.

4 QUANTITATIVE ESTIMATION OF COPPER IN COPPER ORGANIC PRESERVATIVE SALT AND IN TIMBER TREATED WITH COPPER ORGANIC PRESERVATIVE SALT

4.1 The sample in dilute or concentrated filtered solution should contain approximately 0.02 g of copper.

4.2 Reagents

4.2.1 *Ammonium Hydroxide, Concentrated*

4.2.2 *Sodium Thiosulphate Solution* — Dissolve 2·482 1 g of sodium thiosulphate in water and make up to one litre.

4.2.3 *Starch Solution* — 1 g soluble starch is made to paste in 5 ml of water. Add 50 ml water and boil for 1 min with stirring, cool and add one drop chloroform. Use always a freshly prepared solution of starch.

4.2.4 *Nitric Acid, Concentrated*

4.2.5 *Sulphuric Acid, Concentrated*

4.2.6 *Potassium Iodide Solution* — Twenty percent. Dissolve 20 g of potassium iodide in water and dilute to 100 ml.

4.2.7 *Sodium Thiocyanate Solution* — Twenty percent. Dissolve 20 g sodium thiocyanate in water and dilute to 100 ml.

4.3 Procedure

4.3.1 *In Treating Solution*

Take a known mass of filtered treating solution in a porcelain dish and evaporate the solvent over an electric hot plate under hood. Heat the dish strongly with a burner till all the organic matter is destroyed. Cool it for 5 min. Add 2 ml of sulphuric acid and 3 ml of nitric acid. Cover with a watch glass and heat gently until the sample is dissolved. Transfer the solution from the dish into a 300 ml Erlenmeyer flask using dilute nitric acid. Heat the flask until fumes of sulphur trioxide appear and a colourless or light green solution remains. Cool and wash down the sides with 5 ml water and repeat heating till fuming. Cool and add 20 ml of water. Wash down the sides of flask with water, boil for 1 min, cool and neutralize cautiously with concentrated ammonium hydroxide until a permanent precipitate just forms. Add concentrated sulphuric acid drop by drop until the precipitate just dissolves. Boil down to a volume of 30 ml, cool to below 20°C and dilute to 125 ml.

Add 10 ml of 20 percent potassium iodide solution and 5 ml of 20 percent sodium thiocyanate solution and mix thoroughly by rotating the flask. Titrate with sodium thiosulphate solution, adding 2 ml starch solution just before the brownish colour of the iodine disappears. Stop the titration when no blue colour remains.

4.3.1.1 *Calculation*

$$\text{Percentage of copper} = \frac{V \times 0.063\ 5}{M}$$

where

V = volume of sodium thiosulphate consumed, in ml; and

M = mass of sample taken for the test, in g.

4.3.2 *In Treated Timber*

Determine the density in kg/m^3, of the wood sample. Grind the sample to sawdust or cut into small pieces with a knife or use increment borings. Weigh accurately into a tared porcelain crucible about 10 g of the sample. Char the material slowly over a Bunsen burner. When the sample is charred heat strongly until all organic matter is destroyed, cool the ash for 5 min, add 2 ml of sulphuric acid and 3 ml of nitric acid, cover with a watch glass and heat gently until the sample is dissolved. Transfer the solution in 300-ml Erlenmeyer flask using nitric acid and proceed as in **4.3.1**.

NOTE — One increment boring 2 cm long and 0.475 cm in diameter has a volume of 0.354 6 cm^3.

4.3.2.1 *Calculation*

$$\begin{array}{l}\text{Kilograms of copper}\\ \text{per m}^3\text{ of wood}\end{array} = \frac{V \times 0.063\ 5}{M} \times \frac{M_1}{100}$$

where

V = volume of sodium thiosulphate consumed, in ml;

M_1 = mass of one m^3 of wood, in kg; and

M = mass, of sample taken for the test, in g.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Timber and Timber Stores Sectional Committee, CED 9

Organization	*Representative(s)*
Forest Research Institute, Dehra Dun	Dr P. P. Bhojvaid (***Chairman***)
All India Sports Goods Manufacturers Federation, Merrut	Representative
Bamboo Society of India, Bangalore	Shri V. P. Hiremath Shri U. T. Alva (*Alternate*)
Cane and Bamboo Technology Centre, Guwahati	Shri Nipan Deka
Central Building Research Institute, Roorkee	Dr B. Singh Dr (Shrimati) Manorama Gupta (*Alternate*)
Central Public Works Department, New Delhi	Representative
Chhattisgarh Rajya Van Vikas Nigam Ltd, Raipur	Shri R. K. Sharma Shri B.K. Sinha (*Alternate*)
Directorate of Standardization (Ministry of Defence), New Delhi	Shri S. K. Saxena Shri Vijay Shankar (*Alternate*)
Engineer-in-Chief's Branch, Millitary Engineering Services, New Delhi	Shrimati Mala Mohan Shrimati Namrata Kohli (*Alternate*)
Federation of Indian Plywood & Panel Industry, New Delhi	Shri Ajay Baldawa Shri B. K. Banerjee (*Alternate*)
Forest Research Institute, Dehra Dun	Dr (Shrimati) Sadhna Tripathi
Himachal Pradesh Forest Corporation Ltd, Shimla	Representative
Indian Council of Forestry Research and Education, Dehra Dun	Director General
Indian Plywood Industries Research & Training Institute, Bangalore	Director Shri Anand Nandanwar (*Alternate*)
Institute of Wood Science & Technology, Bangalore	Shri S. C. Joshi Dr S.K. Sharma (*Alternate*)
Karnataka State Forest Industries Corporation Ltd, Bangalore	Managing Director Representative (*Alternate*)
Kerala Forest Research Institute, Thrissur	Dr T. K. Dhamodaran
Kutty Flush Doors & Furnitures Co Pvt Ltd, Chennai	Shri K. Sankara Krishnan Col Y. G. Krishnan (*Alternate*)
Madhya Pradesh Rajya Van Vikas Nigam Ltd, Bhopal	Shri A. S. Joshi Shri Ravi Shrivastav (*Alternate*)
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Ministry of Environment & Forest, New Delhi	Shri A. M. Singh
Naval Dockyard Mumbai, Mumbai	Shri Prabhakar Ganpat Mirashi Shri Aravind Yashawant Mhatre (*Alternate)*
Railway Board (Track Directorate), Ministry of Railways, New Delhi	Representative
Rubber Board, Kottayam	Shri S. Mohanachandran Nair Shri N. Rajagopal (*Alternate*)
Uttar Pradesh Forest Development Corporation Ltd, Lucknow	Representative
Uttarakhand Bamboo and Fibre Development Board, Dehra Dun	Representative
WIMCO Limited, Mumbai	Dr Ramesh Chandra Dhiman Shri J. N. Gandhi (*Alternate*)
Wood Technology Association, Yamuna Nagar	Shri S. C. Jolly Shri Manoj Gwari (*Alternate*)

Organization	*Representative(s)*
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Member Secretary
Shrimati Lalthan Pari
Scientist 'C' (CED), BIS

Timber Terminology, Conversion, Seasoning, Preservation, Grading and Testing Subcommittee, CED 9:1

Forest Research Institute (Forest Products Division), Dehra Dun	Dr (Shrimati) Sadhna Tripathi (***Convener***)
ASCU ARCH Timber Protection Limited,	Shri Rajiv Agarwal Shri Tapan Bhadury (*Alternate*)
Borax Morarji Limited, Thane	Shri H. T. Kapadia Shri S. Rangarajan (*Alternate*)
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Central Institute of Mining and Fuel Research, Dhanbad	Shri L. C. Ram Shri Raj Shekhar Singh (*Alternate*)
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Madhya Pradesh Rajya Van Vikas Nigam Limited, Bhopal	SHRI A. S JOSHI
Ministry of Environment & Forest, New Delhi	SHRI A. M. SINGH
North-East Institute of Science & Technology, Jorhat	DIRECTOR
Office of Development Commissioner (Handicrafts), New Delhi	DEPUTY DIRECTOR
Paharpur Cooling Towers Limited, Kolkata	SHRI S. RAMASUNDAR SHRI ABHIJIT SAMUI (*Alternate*)
Rubber Research Institute of India, Kottayam	DIRECTOR
Uttarakhand Forest Development Corporation Ltd, Dehra Dun	PR CH CONSERVATOR OF FORESTS GENERAL MANAGER (*Alternate*)
Western India Plywoods Ltd, Kannur	SHRI P. K. MAYAN MOHAMED DR K. RAGHUNATHAN (*Alternate*)
In personal capacity (*C/o American Connexion, 214, Phase II, Vasant Vihar, Dehra Dun 248006*)	DR SATISH KUMAR

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This Indian Standard has been developed from Doc No.: CED 9 (7832).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi